A RE-EVALUATION OF POLYGONUM MEISNERIANUM IN NORTH AMERICA[1]

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In eastern North America the two widespread species of *Polygonum*, section Echinocaulon, are *P. sagittatum* and *P. arifolium*. These are known by their retrorse barbs, sprawling habit and sagittate to hastate leaves. A third entity, *Polygonum meisnerianum* C. & S. var. *beyrichianum* (C. & S.) Meisn., has gone almost unnoticed, although it was first collected in the United States over 140 years ago. It is one of the widest ranging aquatic angiosperms in the western hemisphere, and is unusual in that it simulates members of section Persicaria in both leaf shape and erect-emergent habit. Retrorse barbs and inflorescence type link *P. meisnerianum* with other "Tear-thumbs" (Echinocaulon); however, its center of distribution and nearest phylogenetic relationships are in eastern South America, not in Asia, as is the case for both *P. sagittatum* and *P. arifolium*.

The purpose of this paper is to bring knowledge of *P. meisnerianum* out of its present state of obscurity, so that the species may now be recognized by manuals and floristic treatments in the southern United States. Two collections from Florida and one from South Carolina are also reported here, and a variety based upon phenotypic modification is placed in synonymy.

Historical Account

Polygonum meisnerianum and *P. beyrichianum* were first described by Chamisso and Schlechtendal (1828) from materials collected on a Brazilian expedition. A few years later, Chamisso (1833) described two additional related species, *P. rubricaule* and *P. stelligerum*. Thus, by 1833 there were four published species descriptions with char-

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acters distributed among members of a group of closely inter-related taxa. This species-complex has its center of distribution in Brazil and Argentina. A number of names have been applied in Latin America since 1833, but most are synonyms whose descriptions add no new diagnostic information. A list of pertinent synonymy appears in the treatment to follow.

Meisner, in Martius' flora of Brazil (1855), reduced *P. beyrichianum* to varietal status, listing the name *P. meisnerianum* C. & S. var. *beyrichianum* (C. & S.) Meisn., which is now the most widely accepted combination. There seems to be sufficient intermediacy in some Brazilian and Argentinian specimens to warrant this change, and the problem is still in need of study; however, plants designated "var. *beyrichianum*" do occur in typical morphological form throughout Brazil and Argentina, extending to Central America, Mexico, Cuba and at least three states in the United States.

The first person to collect *P. meisnerianum* in the United States was T. Drummond, whose specimen number 177 is cited, without date, by Meisner (1855). This specimen, supposedly from Texas, has not been found by the author, but Drummond's number 277, dated 1832, from New Orleans, was found at both the Gray Herbarium of Harvard University and the U. S. National Herbarium.

Specimens collected by J. L. Riddell in Louisiana are partially without dates, but the earliest seems to be August 13, 1838, from Madisonville, Louisiana. He noted in parentheses that the species was undescribed, but labeled it *P. geniculatum* Ridd., a name which he then published in de Candolle's *Prodromus*.

The species was omitted from Chapman's *Flora of the Southeastern States* (1889).

A. B. Langlois collected the plant in 1885 and again in 1892, both times in Louisiana. He noted that it "is pronounced a rare plant."

J. K. Small, in his monograph of North American *Polygonum* (1895), illustrated and re-described specimens under the correct name of *P. meisnerianum* var. *beyrichianum.* It is surprising that this taxon was omitted from his *Manual of the Southeastern Flora* (1933).

Collections of this species have been extremely infrequent in North America since the turn of the century. There are no sheets of it in the herbaria of the University of Texas, Southern Methodist University or Texas Research Foundation, where the aquatic flora of the southwestern states is being studied extensively. There are also no specimens at Louisiana State University or Southeastern Louisiana State University.

In the summer of 1968, I found *P. meisnerianum* var. *beyrichianum* growing at the south end of Lake Miccosukee on the Leon-Jefferson line in Florida. It had been collected once before in northern Florida (D. B. Ward, personal communication) in 1935 by Erdman West, at Newnan Lake in Alachua County. These two stations establish firmly its natural occurrence in Florida, and it has now been included in the Florida checklist.

Recently a state record for South Carolina was collected, but went unnoticed. It was found in Jasper County (S. W. Leonard #2231, and A. E. Radford) in a wet ditch on Highway 601, 1.4 miles north of County road 27-169. The specimens are labelled "*P. sagittatum* L.; unusually narrow leaves".

With the occurrence of *P. meisnerianum* in Florida, Cubà and South Carolina established, the North American distribution of the species may best be described as sporadic around the Gulf of Mexico. The migration route from South America was probably along the expanded coastal plain during the Pleistocene pluvials. The direction of migration is now in doubt, however, since the occurrence of the species in the West Indies, Florida and South Carolina opens up the possibility of an eastern route.

Morphological Transformation

Polygonum meisnerianum var. *beyrichianum* differs from the typical variety of the species as well as its other South

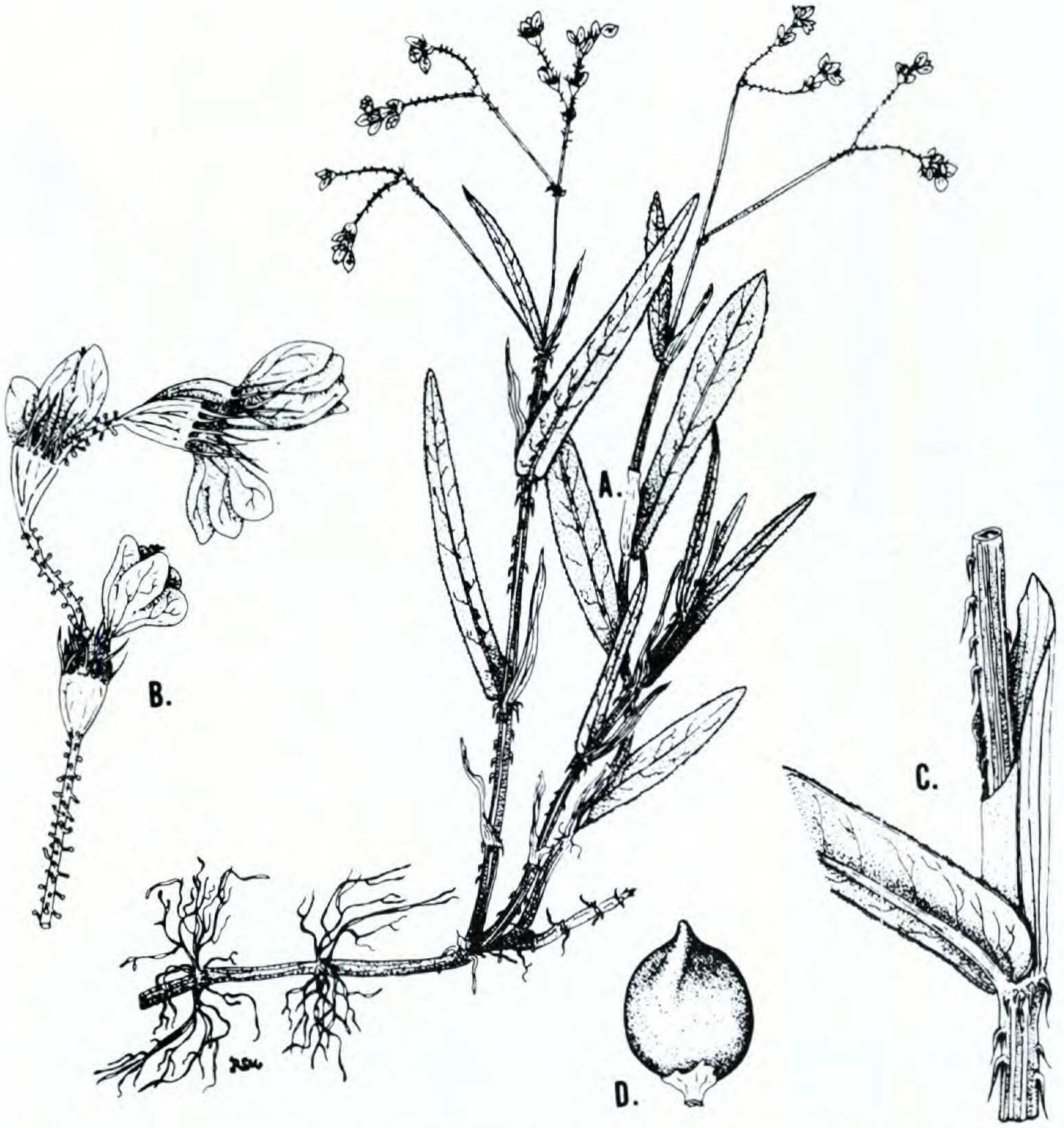

Fig. 1. *Polygonum meisnerianum* C. & S. var. *beyrichianum* (C. & S.) Meisn., a wide-ranging South American aquatic which reaches its northern limits of distribution in Florida, Louisiana and South Carolina. A. habit, showing dichotomously branching inflorescence. B. inflorescence, with glandular petioles. C. nodal region with sheathing stipule (ocrea), clasping leaf base and retrorse barbs. D. trigonous achene.

American relatives in having sessile, slightly auriculate leaves rather than petiolate, sagittate ones. A sagittate-leaved variety, *P. meisnerianum* C. & S. var. *jalapense* Robins., was described in 1900 from Mexico. On examination, the type specimen shows a dense covering of glandular hairs on leaves, petioles and stems, and no barbs or other pubescence.

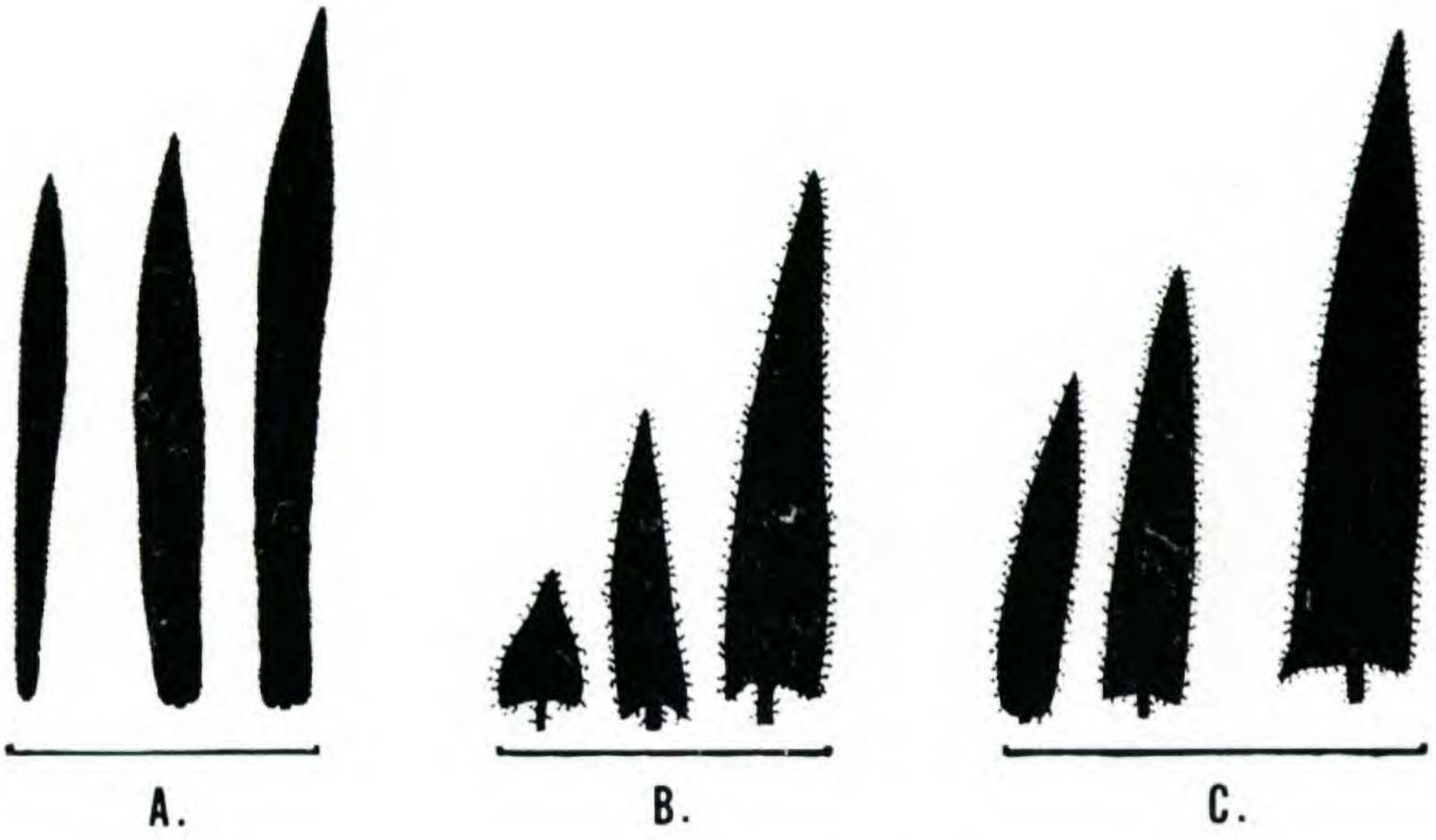

Fig. 2. Leaf silhouettes as evidence that *Polygonum meisnerianum* var. *jalapense* is a name based upon a phenotypic modification of var. *beyrichianum*. A. leaves from *P. meisnerianum* var. *beyrichianum* collected in Florida. B. juvenile leaves from rhizomes of the same plants after being cut back and grown in the greenhouse. These leaf types persisted for months. C. leaves from the type specimen of *P. meisnerianum* var. *jalapense*.

Mass collections of var. *beyrichianum* sent from Florida by R. K. Godfrey in 1969 showed typical leaf morphology throughout (Fig. 1); however, rhizomes of these plants, cut back and shipped live, gave surprising results when grown in a Virginia greenhouse. Young shoots produced only sagittate leaves with substantial petioles. The leaves and stems were covered with glandular hairs and lacked barbs or other pubescence. Thus, var. *beyrichianum* simulated the type specimen of var. *jalapense* almost exactly in its juvenile growth (Fig. 2), and continued to do so for many months after its disturbance and etiolation. It is now clear that "var. *jalapense*" can be induced environmentally, and should not retain taxonomic status. This atavistic manifestation also gives good evidence that the leaf type of var. *beyrichianum* is a derived condition, and that this variety has evolved from plants with sagittate leaves.

Pertinent Synonymy

Polygonum meisnerianum var. *beyrichianum* appears, at present, to be the only species and variety of the South American Tear-thumb group which occurs in North America. It is listed here with its Brazilian relatives and the most frequently used synonyms for the group.

1. *Polygonum meisnerianum* C. & S. var. *meisnerianum*, Linnaea, 3: 42. 1828.
2. *Polygonum meisnerianum* C. & S. var. *beyrichianum* (C. & S.) Meisn., in Martius' Fl. Bras., 5: 19. 1855.
    - *P. beyrichianum* C. & S., Linnaea 3: 42. 1828.
    - *P. multiangulare* H. & A., Comp. Bot. Mag. 2: 62. 1836.
    - *P. geniculatum* Ridd. ex Meisn., DC. Prodromus, 14: 42.
    - *P. chamissoanum* Wedd. (non Steud.), Ann. Sci. Nat. 3(8): 254.
    - *P. türkheimii* Vatke ex Small, Bull. Torr. Bot. Club **19**: 370. 1892.
    - *P. meisnerianum* C. & S. var. *jalapense* Robins., Proc. Amer. Acad. 3: 324. 1900.
3. *P. meisnerianum* C. & S. var. *usterianum* Mattos, Loefgraenia 22: 2. 1965.
4. *Polygonum rubricaule* Cham., Linnaea **8**: 130. 1833.
5. *Polygonum stelligerum* Cham., Linnaea **8**: 131. 1833.
    - *P. acanthophyllum* Lindau, Botan. Jahrb. **19**(48): 12. 1894.
    - *P. meisnerianum* C. & S. var. *setosum* Chod. & Hass. Bull. Herb. Boiss. ser. 2, 3: 392. 1903.

In addition to the preceding list there are also combinations under the genus *Tracaulon*.

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ERAGROSTIS PLANA IN SOUTH CAROLINA. — *Eragrostis plana* Nees has been collected twice (*Ahles & Haesloop* 52789 in 1959, NCU; *Ahles & Haesloop* 53840 in 1960, NCU) on "waste ground around the Santee Wool Combing Mill" at Jamestown, South Carolina. This stout, cespitose perennial, with linear, many-flowered spikelets, and glandular-punctate lemma nerves, is reported by Chippendahl [1955, A guide to the identification of grasses in South Africa (part I of *The grasses and pastures of South Africa*). Cape Times Limited, Parow., C.P., p. 316] to grow in South Africa and "tropical Africa". There are no previous records of its occurrence in North America. The grass apparently is closely related to the weedy annual *Eragrostis cilianensis* (All.) Lutati [*E. megastachya* (Koel.) Link] which also has spikelets with many florets and glandular-punctate lemma nerves. Of special note on the Jamestown specimens is the occasional occurrence of 5 strong (glandular-punctate) nerves on the lemma. This characteristic was not noted by Chippendahl and is the first variation known to the writers from the remarkably consistent 3-nerved condition of the *Eragrostis* lemma.

F. W. GOULD AND R. I. LONARD
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